

REMARKS

Claim 1 has been amended by requiring that a non-reducible metal oxide catalyst be used when the stripping gas is a hydrogen gas and a Group VIII promoted Group VIB catalyst when the stripping gas is an inert gas, such as nitrogen.

Applicants request that the Examiner enter this three times amended claim 1 since it does not present new matter.

Applicants acknowledge the withdrawal of the claim rejections described in paper no. 4 because of the amendment filed on July 22, 2002 by applicants' attorney.

Claim Objections

Claims 5, 6, and 14 have been objected to under 37 CFR 1.75(c) as being of improper dependent form for failing to further limit the subject matter of a previous claim. The Examiner states that the limitation of claim 5 that the feedstream is a hydrodesulfurized feedstream is already contained in claim 1. Applicants have canceled claims 5, 6, and 14 as suggested by the Examiner. Therefore, applicants request that the Examiner withdraw this objection.

Rejection Under 35 U.S.C. 103(a)

Claims 1-7 and 9-14 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Hatanaka et al. (US 5, 906,730) in view of Harandi (US 5,554,275).

Examiner's Position

The Hatanaka et al. reference is cited as disclosing a multi-step hydrodesulfurization process in which the hydrocarbon feed (e.g. gasoline) is hydrodesulfurized in a first step at conditions that minimize hydrogenation of olefins and

without substantially changing the octane number of the feed. The product from the first step contains thiols (i.e., mercaptans) that are produced in the first step. The first step product is then further hydrodesulfurized in a second step and a third hydrodesulfurization step can be performed, if needed.

The Examiner notes that the Hatanaka et al. reference does not disclose the contacting of the feed with a catalyst in the presence of a stripping gas as the second desulfurization step.

The Examiner again notes that the Harandi patent discloses a process for desulfurizing an olefinic hydrocarbon feed by, such as an FCC crackate, by passing a liquid hydrocarbon into a stripper having a bed of hydrodesulfurization catalyst particles and contacting the liquid with the catalyst bed while passing a stripping gas (i.e., hydrogen) into the stripper. The catalyst may be a Group VI and Group VIII metal catalyst such as cobalt-molybdenum on a support, such as alumina.

The Examiner believes that it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Hatanaka et al. by utilizing the desulfurization process of Harandi as the second desulfurization step because separate desulfurization and stripping steps will not be required.

The Examiner also believes it would have been obvious to combine the teachings of these two references by utilizing a stripping gas having the composition as in claim 4 because any concentration of hydrogen would be expected to promote the hydrodesulfurization reactions. The Examiner also believes it would have been obvious to utilize the concurrent system and by utilizing feeds to the second desulfurization step having sulfur concentrations as in claims 12 and 13.

Applicants' Position


The claims as now amended require that a catalyst comprised of a non-reducible metal oxide be used when the stripping gas is a hydrogen-containing stripping gas and a catalyst comprised of a Group VIII promoted Group VIB when the stripping gas is an inert gas, such as nitrogen. This is not disclosed or suggested in either Hatanaka et al. or Harandi. For example, the hydrodesulfurization catalyst taught in Hatanaka et al are convention Group VIII/Group VIB on support catalysts. Further, there is no suggestion of using a stripping gas in Hatanaka et al. They remove H₂S from a hydrogen recycle stream by using an amine absorbing apparatus. Harandi teaches stripping with a reactant gas containing hydrogen under pressure. (See column 3, lines 26 and 27)

Thus, is it applicants' position that neither Haranaka et al. nor Harandi disclose the present invention as now claimed. Therefore, applicants request that the Examiner reconsider and withdraw this rejection and pass this application to allowance.

The Examiner is encouraged to call the undersigned attorney should the Examiner wish to discuss this application.

Respectfully submitted:

Date: 1-13-03



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**Marked-Up Claims Accompanying Response to First Office Action After Filing An
RCE Application for USSN 09/676,875**

1. (Three Times Amended) A method for decreasing sulfur levels in a previously hydrodesulfurized mercaptan sulfur containing olefinic naphtha feedstream comprising the steps of passing said mercaptan sulfur containing olefinic naphtha feedstream over a fixed bed catalyst in a three phase, gas, liquid, solid system in the presence of a stripping gas, for a time and temperature and pressure sufficient to decompose at least a portion of said mercaptans to produce olefins, H₂S, as an off gas, and a hydrocarbon product stream having decreased amounts of mercaptan sulfur from said H₂S and said stripping gas and wherein when said stripping gas is a gas stream comprising hydrogen, said fixed catalyst bed comprises [(a)] a non-reducible metal oxide [or (b) a Group VIIIB metal promoted Group VIB catalyst], and wherein when said stripping gas is an inert gas said fixed bed catalyst comprises a Group VIIIB metal promoted Group VIB catalyst.